WHAT IS CLAIMED IS:

1. A field emission cold cathode device of a lateral type comprising:

a support substrate;

a cathode electrode disposed on the support substrate and having a first side surface;

a gate electrode disposed on the support substrate laterally side by side with the cathode electrode and having a second side surface opposing the first side surface; and

an emitter disposed on the first side surface to oppose the second surface, the emitter comprising a metal plating layer formed on the first side surface and a plurality of granular or rod-shaped micro-bodies supported in the metal plating layer in a dispersed state, the micro-bodies consisting essentially of a material selected from the group consisting of fullerenes, carbon nanotubes, graphite, a material with a low work function, a material with a negative electron affinity, and a metal material.

2. The device according to claim 1, wherein the metal plating layer comprises a resistance ballast layer containing an additive material, which increases a resistance of the metal plating layer.

3. The device according to claim 2, wherein the metal plating layer has a resistivity of 10^{-8} Ωm to 10^{-4} Ωm.

4. The device according to claim 1, wherein the micro-bodies are partly buried in the metal plating layer.

5. The device according to claim 1, wherein the micro-bodies are entirely buried in the metal plating layer.

6. The device according to claim 1, wherein the micro-bodies are granular bodies and have a radius of not more than 100 nm.

7. The device according to claim 1, wherein the micro-bodies are rod-shaped bodies and have distal ends with a radius of curvature of not more than 50 nm.

8. The device according to claim 1, wherein the micro-bodies are rod-shaped bodies, and 50% to 100% of the micro-bodies are oriented within an angular range of $\pm$ 20° relative to a major surface of the support substrate, where the cathode electrode is disposed.

9. The device according to claim 1, wherein the micro-bodies are rod-shaped and hollow bodies, and a filler layer consisting essentially of a conductive material is disposed in the micro-bodies.

10. The device according to claim 1, further comprising a gate projection disposed on the second side surface to oppose the first side surface, the gate projection comprising a gate metal plating layer consisting essentially of the same material as that of the metal plating layer, and a plurality of gate

micro-bodies supported in the gate metal plating layer in a dispersed state and consisting essentially of the same material as that of the micro-bodies.

11. The device according to claim 1, further comprising a surrounding member cooperating with the support substrate to form a vacuum discharge space that surrounds the cathode electrode, the gate electrode, and the emitter, and an anode electrode disposed on the surrounding member at a position opposing the cathode electrode and the gate electrode.

12. A vacuum micro-device comprising:

a support substrate;

a cathode electrode disposed on the support substrate and having a first side surface;

a gate electrode disposed on the support substrate laterally side by side with the cathode electrode and having a second side surface opposing the first side surface;

an emitter disposed on the first side surface to oppose the second surface, the emitter comprising a metal plating layer formed on the first side surface and a plurality of carbon nanotubes supported in the metal plating layer in a dispersed state;

a surrounding member cooperating with the support substrate to form a vacuum discharge space that surrounds the cathode electrode, the gate electrode, and the emitter; and

an anode electrode disposed on the surrounding member at a position opposing the cathode electrode and the gate electrode.

13. The device according to claim 12, wherein the surrounding member comprises a transparent opposite substrate opposing the support substrate, and the anode electrode comprises a transparent electrode and a fluorescent layer are disposed on the opposite substrate in the vacuum discharge space.

14. The device according to claim 12, wherein the metal plating layer comprises a resistance ballast layer containing an additive material, which increases a resistance of the metal plating layer.

15. The device according to claim 14, wherein the metal plating layer has a resistivity of 10^{-8} Ωm to 10^{-4} Ωm.

16. The device according to claim 12, wherein 50% to 100% of the carbon nanotubes are oriented within an angular range of $\pm$ 20° relative to a major surface of the support substrate, where the cathode electrode is disposed.

17. The device according to claim 12, further comprising a gate projection disposed on the second side surface to oppose the first side surface, the gate projection comprising a gate metal plating layer consisting essentially of the same material as that of the metal plating layer, and a plurality of carbon

nanotubes supported in the gate metal plating layer in a dispersed state.

18. A method of manufacturing the device according to claim 1, comprising:

forming an intermediate structure by disposing the cathode electrode and the gate electrode on the support substrate;

preparing a plating suspension by suspending the micro-bodies in a plating solution for the metal plating layer; and

forming the metal plating layer on the first side surface of the cathode electrode by dipping the intermediate structure in the plating suspension and subjecting the intermediate structure to a plating process, the metal plating layer comprising the micro-bodies dispersed therein.

19. The method according to claim 18, wherein the plating process is an electroplating process.

20. The method according to claim 19, wherein the plating process is performed while forming an electric field between the cathode electrode and the gate electrode.